

west of Cape Colony, the Orange River Colony, Algoa Bay, and various intermediary stations.

In this volume, which contains 258 illustrations, Mr. Johnson has confined himself to coordinating the various discoveries of stone implements he has made during the past four years in South Africa, with descriptions of the deposits from whence they were derived; he, however, makes no attempt to review the abundant literature on the same subject already published. The exceptional value of the author's work rests in the fact that he makes little or no direct reference to surface finds or to specimens of man's handiwork which, in the shape of flakes, cores, and implements, are scattered over the surface of South Africa, in extraordinary profusion in some localities; but in every instance in which he describes his "finds" he takes us to the actual deposits from which he extracted the implements, whether it be the high plateau gravels in the neighbourhood of Johannesburg, the river gravels of the Zambezi, Vaal, and Orange rivers, the more recent alluvial deposits of the country, or the middens on the coast of Algoa Bay.

The author divides the stone implements of South Africa into three groups, which he considers well defined, namely, Primitive, Palæolithic, and Advanced; these are, in his opinion, the South African equivalents of Eolithic, Palæolithic, and Neolithic. The artificial character of the implements of the primitive group is, the author admits, still a matter in dispute, but when we come to the Palæolithic group we reach sure ground. If the old level gravels of the Zambezi, below the Victoria Falls, from which undoubtedly Palæolithic implements have been derived, were deposited prior to the retrocession of the present falls, and there is strong evidence in favour of such being the case, then the presence of man in South Africa is relegated to a past, bewildering in its antiquity. Similar conclusions are arrived at from the presence of Palæolithic implements in the old river gravels of the Vaal and Orange rivers. When we compare the more carefully fashioned implements (which, however, are not represented in Mr. Johnson's illustrations), notably from the Cape Flats, the laterite beds of Natal and Zululand, from rock shelters and the caves and middens of the coastline of Table Bay and Algoa Bay, with the rude weapons of the old river gravels, we unquestionably find a progressive element in their making, though they are not comparable in artistic merit with those found so abundantly in Egypt, for instance. This perhaps may be due to the stone-implement makers of South Africa not having had at their disposal equally suitable material to work on.

Though Mr. Johnson's division of the stone implements of South Africa into three definite groups may be considered by some as perhaps premature in our present state of knowledge, yet it is a step in the right direction, and this volume with its useful illustrations will certainly be welcomed by students of South African prehistoric archaeology.

#### OUR BOOK SHELF.

*Pocket-Book of Aéronautics.* By Hermann W. L. Moedebeck, in collaboration with O. Chanute and others. Authorised English edition, translated by W. Mansergh Varley. Pp. xiii + 496. (London: Whitaker and Co., 1907.) Price 10s. 6d. net.

In this handy little volume we have an excellent comprehensive summary of the whole subject of aéronautics, and the English reading public have to thank Major Moedebeck for producing such a work which has been so capably translated by Mr. Varley.

Although called a pocket-book, the book might really be described as a treatise on the subject, so ably and so well arranged is the mass of material dealt with. In fact, the book takes a very broad view of aéronautics, and leads off with chapters on the physical properties and technology of gases, the physics of the atmosphere, meteorological observations in balloon ascents, and the computation of results. Such a beginning is an indication of the very scientific and complete way in which the author set about bringing the matter pertaining to aéronautics to a focus, and his various collaborators, ten in all, have succeeded notably in their task.

Further, the historical survey of previous attempts to gain the supremacy of the air is by no means omitted, and admirable summaries are included which give the reader a comprehensive and intelligent view of the steps taken in each mode of attempted flight.

To give some idea of the contents and authors who have contributed to the book, it may be mentioned that the subjects referred to above are from the pens of Dr. R. Emden, Lieutenant J. Stauber, and Prof. V. Kremser. The articles on the technique of ballooning, on ballooning, on military ballooning, historical account of artificial flight, and on air-ships, are treated by the author. Prof. W. Köppen deals with kites and parachutes. Dr. Miethe deals with balloon photography, while Prof. W. Kutta gives an account of photographic surveying from balloons. The articles on animal flight by Prof. Karl Müllenhoff, artificial flight by the late Otto Lilienthal and Mr. Octave Chanute, flying machines, motors and air-screws by Major Hermann Hoernes, complete the various sections of the subject. A list of aéronautical societies, numerous appropriate and useful tables, and an index conclude the volume.

In the preface it is stated that the suggestion of translating this work is due to Mr. Alexander, the well-known authority on aéronautics. English speaking aéronauts, therefore, doubly owe to him their gratitude, for the translator's work is not only excellently done, but he has adapted various tables for the use of English readers, and has added an index.

*Blackie's Nature-drawing Charts.* (London: Blackie and Son, Ltd., n.d.)

This is a series of fifteen sheets bearing coloured drawings of twigs or portions of a plant to show the nature of the flowers or fruit for use in art schools, more especially in schools of design. It is intended that the charts should be used in combination with living specimens, being displayed to serve as a guide in noting essential features and in producing an artistic drawing. Small figures are given of parts suited to conventional treatment, and several examples of conventionalised designs are presented on each chart. These show the adaptation of plant-forms for such purposes as brush-work ornamentation and the design of stencils, wall-papers, tapestries, &c.

A book of instructions is supplied to explain which charts or designs are suitable for different standards, and to provide other suggestions as to their

utility. The more elementary drawings reproduce the laurel, snowdrop, tulip, and oak; the buttercup, poppy, and wild rose are considered suitable for a higher standard, and the blackberry, narcissus, and marguerite daisy are selected for the most difficult studies. The representations of the plants are botanically satisfactory, except the beech-fruits, that fail in colour and shape. In a few of the adapted designs, while making allowance for conventional treatment, there is unnecessary departure from the natural arrangement. For instance, the opposite insertion of the leaves in the privet is natural and characteristic, and should be maintained; similarly with regard to the pinnate leaves of the rose. It would have been useful to include in the explanatory booklet a short account of such botanical facts as the forms and insertion of leaves, the parts of a flower, their cyclic and acyclic arrangements, and similar details. For the most part, however, the designs do maintain and emphasise the natural characteristics, thereby fulfilling the purpose of training students to derive their artistic conceptions direct from nature. The production of the charts is highly creditable, the drawings are bold, and the colour contrasts effective.

*Problems in Surveying, Railroad Surveying, and Geodesy, with an Appendix on the Adjustments of the Engineer's Transit and Level.* By Howard Chapin Ives and Harold Ezra Hilts. Pp. ix + 136. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1906.) Price 6s. 6d. net.

With such a full title-page this book fairly well describes itself. The authors have been engaged in teaching engineering and surveying, and have found this graded series of simple problems useful for sustaining the interest of their students in their work and for covering the course required by the faculty. The book is addressed to those who are professionally interested in such matters, or who wish to acquire the capacity to carry out certain operations in the field with facility, and with that amount of accuracy which the nature of the work demands. Consequently, there is little reference to theory. We have the ordinary methods of measuring by chain and problems connected with levelling. The compass, theodolite, and sextant come under review, and the mechanical adjustments of these instruments are described, but with no great minuteness. Greater care might have been bestowed on some of the formulæ given; those on p. 36 have apparently been misprinted. The railroad surveying problems are more satisfactory, and seem to be of practical utility.

A chapter on astronomical problems of a most elementary character has been added. In the preparation of this chapter the authors acknowledge the assistance they have received from a third authority. It must strike anyone with surprise that the authors should consider themselves competent to produce a book of this type, and yet feel it necessary to invite or to accept outside aid.

W. E. P.

*The Sense of Touch in Mammals and Birds, with Special Reference to the Papillary Ridges.* By Dr. Walter Kidd. Pp. viii + 176; illustrated. (London: A. and C. Black, 1907.) Price 5s. net.

HAVING in a companion volume treated of the direction of the hair in animals Dr. Kidd, in the one now before us, turns his attention to the kindred subject of the structure and function of the papillary ridges on the tactile surface of their hands and feet. Although the subject is by no means new, the author has studied it in a fuller manner than at least most of his predecessors, and has a new theory with regard

to the function of the ridges in the Primates, in which alone these structures attain full development. In monkeys, at any rate, it has been generally considered that the main purpose of the rough surface produced by the papillary ridges is to ensure firm hold in grasping. Without denying that this may be a part of their function, Dr. Kidd is, however, of opinion that there are other important uses, which vary in different groups. In man, for instance, the papillary ridges in the hand alone exercise the function of discriminative sensibility, and those in the foot that of maintaining the equilibrium of the body, whereas in the lower Primates both functions are discharged by the ridges of the two pairs of limbs, although sensibility is less marked in the front pair than in the human hand. The most interesting part of the author's conclusion relates, however, to the papillary ridges of lemurs, which are much more complicated than those of apes and man, and are accordingly believed to be subservient to the necessity for special means of preserving the equilibrium in the case of nocturnal creatures.

R. L.

*Zur Wirtschafts- und Siedlungs-Geographie von Ober-Burma und den Nördlichen Shan-Staaten.* By Dr. H. J. Wehrli. Pp. 130. (Zurich: Lohbauer, n.d.)

THOUGH in completeness and fulness of illustration this popular handbook of the British province of Burma bears, of course, no comparison with Sir J. G. Scott's recent monograph, it contains in a short space all that a merchant or a traveller intending to visit the country needs. The physical geography, climate, ethnology, natural productions, and industries are clearly described in a series of chapters illustrated by four maps and twelve photographic plates. The book is frankly a compilation from the best authorities, of which a full bibliography is appended. The maps, like all German work of the kind, are good, but the political map would be more useful if the boundaries were marked in colours. Except some of the handbooks for emigrants issued by our more important colonial Governments, we have no geographical series in English which corresponds with this. The organisation which has just been started to spread a knowledge of the Empire among British schoolboys might well provide a series of handbooks of this class.

#### LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

#### International Investigation of the Upper Air.

THE International Commission for Scientific Aéronautics has for some years past arranged that observations in the upper air by means of kites and balloons should be made on certain pre-arranged days, generally the first Thursday in each month. At the conference held at Milan in October last, M. Teisserenc de Bort suggested that better results would be obtained if a series of observations could be made on several successive days instead of on isolated days as hitherto.

It has accordingly been arranged that while the observations on the first Thursday in each month should be continued, some further days should be arranged for a more extended series of observations. The first of these series is to take place in the fourth week in July, and it is hoped that, besides the ordinary observatories that take part in the monthly ascents, as many meteorologists as possible should assist in order that observations may be obtained from a number of widely extended stations